U.S. Army Corps of Engineers

Tulsa District
Project Update

2008 Recreation Services to be Reduced

Floods and Ice Storm Cause Extensive Damage

Billy Banks
Chief, Operations Division

Tulsa District entered fiscal year 2008 facing a significant challenge. While the fiscal year 2008 Energy and Water appropriations provides the required funds to "operate and maintain" our projects and provide normally expected services, our facilities are in a degraded condition caused by recent extreme weather events. The record breaking summer floods covered the entire District, from the northernmost reaches of the Arkansas River Basin in Kansas to the southernmost reaches of the Red River Basin in Texas. This area included the entire state of Oklahoma.

While Tulsa District projects prevented an estimated 16,000 downstream structures from flooding and approximately $681 million in damages, the projects themselves sustained heavy damage. Our current working estimate for required repairs is $34.5 million.

High priority items include repairs to embankments and outlet works to ensure the projects continue to operate safely. The repairs are also necessary prevent additional damage, and cost, during the next flood event.

Fort Gibson Lake, Taylor Ferry Beach, was destroyed when it became submerged by rising lake level.

Recreation areas also sustained heavy damage. Most of the District's parks were submerged in water for weeks which completely destroyed many roads, utilities, toilets, and shower facilities. The recreation area damages will be the most visible to the public because many parks will be partially closed or operated with reduced services such as the lack of electrical hookups or shower facilities; use of portable toilets in lieu of destroyed permanent restrooms; missing courtesy docks; and degraded or closed beaches, playgrounds, hiking trails, shelters, and picnic tables.

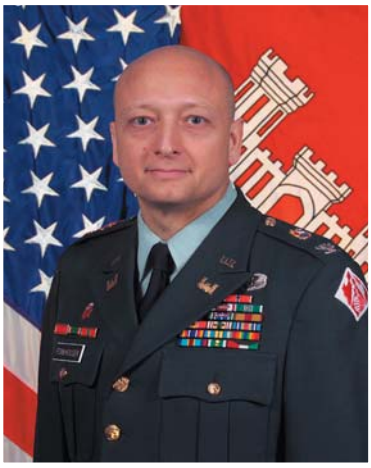
With fantastic support from volun-

Continued ... page 5

June-July 2007 Flood Impact

- 18 to 45 inches of rain over Tulsa District (June/July)
- 40 of 50 District-managed flood pools in flood operation
- 7 District lake pool levels reached into the surcharge pool area
- 7 additional projects were less than 1 foot from top of flood pool
- $34.5 million estimated damages to recreation facilities
- 160 public use areas at 25 projects have damages that threaten partial closure of facilities, or reduced services, for public safety

District Commander's Perspective



Col. Anthony Funkhouser
Commander Tulsa District

On June 29, 2007, I assumed command of this outstanding and professional organization. Tulsa is a unique District with a broad range of civil, military, environmental, and interagency projects. There is not a day that goes by that Tulsa District is not impacting our communities and our nation. We take great pride in our priorities of public safety and good stewardship of our nations resources.

Our greatest contribution to the nation is our selfless support to the Global War on Terrorism; we continue to have the third largest number of deployed employees from one district. In addition to our national support, I have witnessed first hand the team's professionalism and interest in the safety of our local communities, specifically when we experienced record flooding throughout the Midwest and an unprecedented ice storm that left a third of Oklahoma without power. Our team, while impacted by these events, was able to selflessly continue their missions under some of the most arduous conditions. I have personally received countless thanks for the efforts of Tulsa District employees from our Congressional leaders, U.S. Army Corps of Engineers leaders, and the great people of Kansas, Oklahoma, and Texas.

Our Chief of Engineers, LTG Robert Van Antwerp, often talks of the book *Good to Great*. This book explains how organizations separate themselves from being average to sustaining themselves at a great level. Tulsa District has all the characteristics of a great district -- disciplined people, disciplined thought, and disciplined action.

Disciplined people is about having selfless leaders and getting the members with the right skills to be part of our team. In 2007, we saw a number of key leaders retire. But for every retirement, there was another great person prepared to assume the responsibilities.

Disciplined thought is about assessing ourselves and the team and facing the facts of what we can and cannot do. We must only say what we can do, and do what we say. Based on these facts, we must seek to be the best at our "core" competencies. Over the years, we have developed "core" capabilities that we want to maintain and grow in the District. These "core" capabilities include dam safety, hydrology and hydraulics functions, emergency management, water supply functions, construction engineering management, environmental, real estate, contracting, and regulatory. These "core" areas will be the foundation of the District as we move toward 2012.

Disciplined action is where we strive to be; where all employees know what has to be done and they do it without excessive controls. Employees understand the processes and on their own initiative, look to make the organization better.

As part of the plan to develop, train, and maintain expertise in these areas of discipline, the District continued and

Continued ... page 3

Corps of Engineers

Missions

The mission of the United States Army Corps of Engineers, the world's preeminent public engineering agency, is to provide quality, responsive engineering services to the nation and its armed forces. The Corps plans, designs, builds and operates water resources projects; designs and manages military facility construction for the Army and Air Force at home and abroad; provides design and construction management support for other Defense and Federal agencies; cleans hazardous areas across the nation through the Formerly Used Defense Sites program and the Formerly Utilized Sites Remedial Action Program; and conducts state-of-the-art engineering research and design at its Engineer Research and Development Center.

Over its 230 year history, the Corps of Engineers mission has evolved. What began as a military engineering mission for the nation in the 18th Century adapted into a major peacetime mission in the 19th Century. The Corps helped develop a vast water resource infrastructure, initiated development of the first national parks, and linked navigable waterways together to move commerce across states.

In the 20th Century, the Corps civil mission changed again with the adoption of more water resources development and management duties including flood control, hydropower, recreation, water supply, shore protection, and disaster relief. More recently, environmental protection and restoration missions were entrusted to the Corps.

As society's requirements and values have changed, the Corps programs have changed to reflect new national priorities.

U.S. Army Corps of Engineers ®

will continue to:

1. Seek challenging projects to maintain competencies and expertise.

2. Centralize our management of deployable resources to support the Corps priority missions at the strategic level.

3. Develop and execute a training plan to support our defined areas of expertise, mission focus, and workforce.

4. Partner as a regional business center with sister districts to share our capabilities and develop our employees. Several events were conducted with Little Rock, Galveston, and Fort Worth Districts in 2007 and will continue as we look for opportunities to work together and mutually support our "core" capabilities.

5. Hire employees whose strengths compliment our "core" capabilities and bring a diverse breadth of capabilities to the organization as we begin a cycle of adjustments in our workforce due to retirements.

Integrating these disciplines in the future is how we will continue to grow as an organization and continue our reputation as a dependable, professional, and quality Engineer organization that executes on time and to standard.

Physically, there have been many changes to our organization. Our Table of Distribution and Allowances stands at 496 civil works authorizations and 138 military programs authorizations for a total authorization of 634 positions. Additionally, our Information Management Office converted to a nationally centralized organization, U.S. Army Corps of Engineers-Information Technology (ACE-IT), and our Logistics Management Office converted to the Logistics Delivery Point (Tulsa) which is under the U.S. Army Corps of Engineers Logistics Activity (ULA) in Millington, Tennessee. We will continue to operate regionally for the foreseeable future.

Tulsa District continued to actively support the nation's Global War on Terrorism, the Number 1 mission of the Corps of Engineers, as employees deployed to Gulf Region Division in Iraq and to the Afghanistan Engineer District. Taking advantage of the opportunities to engage in nationally significant projects was and is an excellent means to not only support these projects but also to maintain and further develop the "core" competencies needed to perform our traditional mission assignments. We are currently engaged in nationally significant projects in support of Fort Worth District for Fort Bliss and the Department of Homeland Security Primary Fence 225 Program.

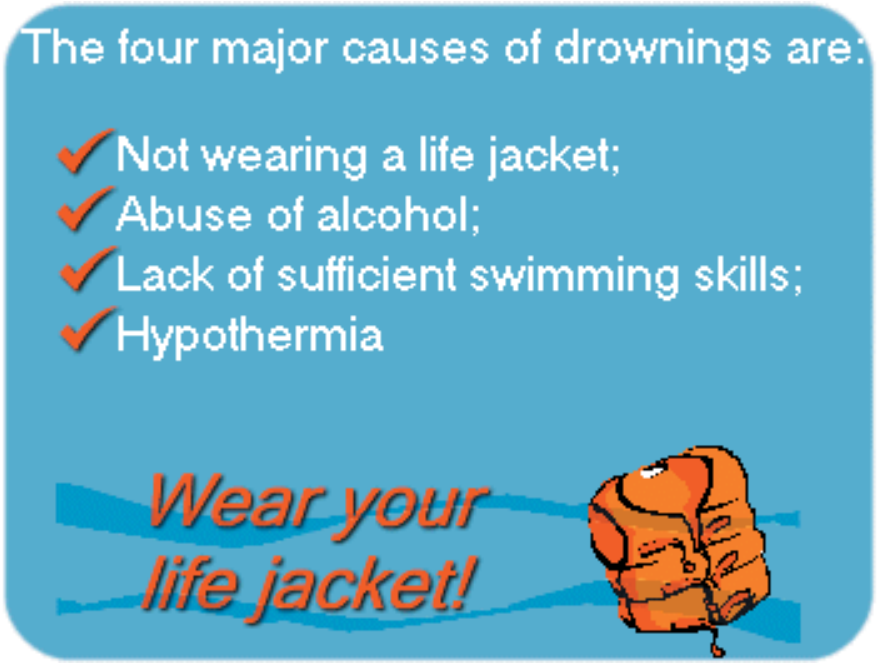
In the future, we will continue to support projects outside our normal area of operations, including the White Sands Grow the Force facilities. We also have opportunities within our own geographical boundaries for challenging work in support of the Veterans Administration, the Department of Energy Pantex Plant, the Environmental Protection Agency, numerous Tribes, and others as we see increased support to International and Interagency Services. Our military program will remain robust for several more years, including the Base Realignment and Closure (BRAC) funded projects at Fort Sill, Oklahoma, for the construction of the Air Defense Artillery (ADA) School and ADA Brigade.

With the passage of the Water Resources Development Act of 2007 in December, the civil works program will experience new, exciting opportunities in 2008. Projects which will continue to provide solutions to water resource needs in our region include: the Red River Chloride Control Project; the deepening of the McClellan-Kerr Arkansas River Navigation System; the Arkansas River Corridor Project; support to the state of Oklahoma for development of the Comprehensive Water Plan; numerous Continuing Authority Program projects; and dam safety projects at Canton, Keystone, and other locations.

Internally, we will strive to maximize our major maintenance efforts to address the growing critical maintenance backlog. Balancing public safety with our aging project infrastructure, we must prioritize our efforts. I have witnessed firsthand the impacts of equipment overtaken by rust, and we will make every effort to reduce these risks to our projects.

Our strategic plan is dynamic, disciplined, and reflects the best interests of the Corps mission. It seeks to take us from good to great in the future years with those who work hard to ensure that mission is executed to the highest standard.

The District's story for 2007 is how we strived to go from good to great each day. That outstanding effort sets the stage for our success in 2008 and beyond.



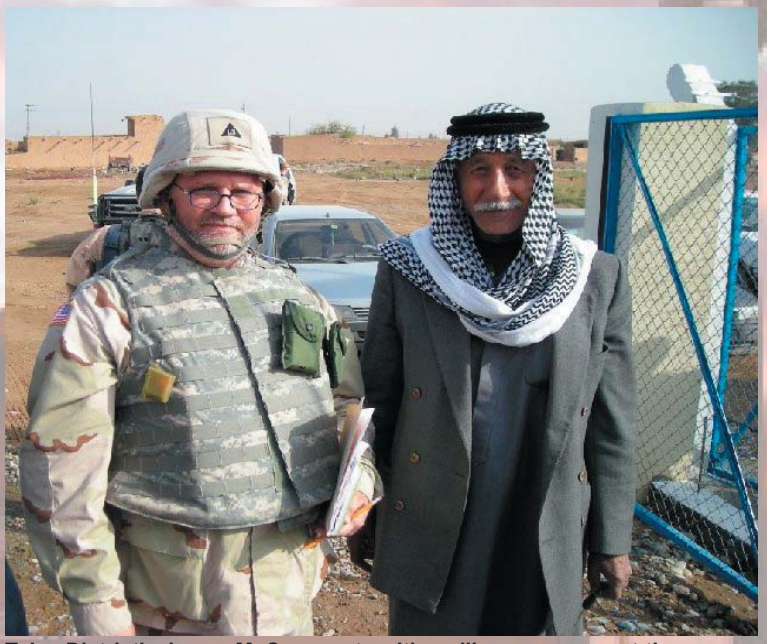
Volunteering for Global War on Terrorism is Rewarding, Challenging, Enriching

James McCoy

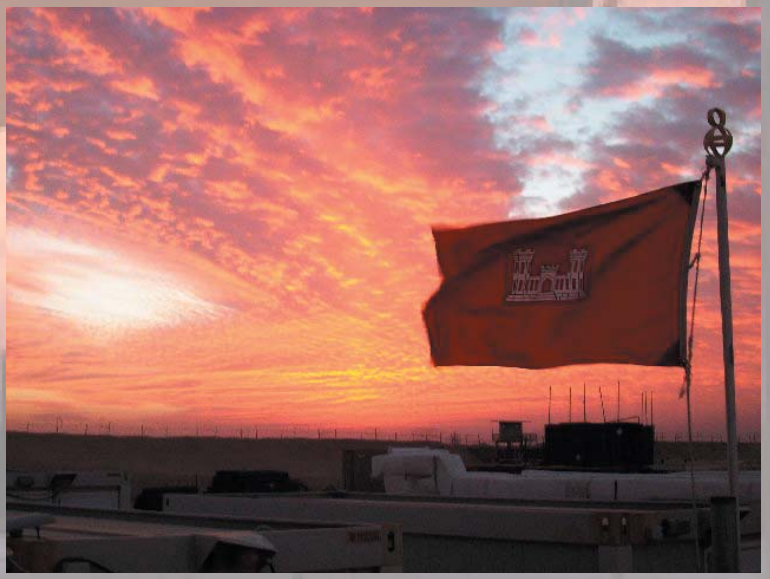
"I'm sure there have been enough stories about how basic the life is here – so much different than the higher profile places like Baghdad, Mosul, the division and district offices, and the rest. Those of us at the more remote locations do live a bit closer to the vest, but there are other significant benefits, like this beautiful sunset.

"You might have seen my project in the news lately; it's hard to tell from here. We did get a write up in the Stars and Stripes a little while back. I am the construction representative for the Modular Detainee Housing Units sometimes called Bucca Boxes. We've been in construction for about two months and are almost ready to turn over our second compound for detainee occupancy.

"This job is difficult and frustrating, tremendously challenging and yet extremely rewarding. There are days when I am just plain wore out and happy to see my bunk. I work outside every day, usually in excess of my scheduled 10-hour days. My contractor is Iraqi owned but has a large TCN content (mostly Indian and Nepalese). I have a very good working relationship with the engineers and the crews which makes the work that much more enjoyable. I occasionally have lunch (my choice of Iraqi or Indian cuisine) on site with the laborers, chatting about any subject, fighting through unfamiliar words and concepts, learning Arabic while teaching English, and enjoying the down time as comrades working together. I have even gotten my project engineer (a 24-year-old kid) to play small jokes on his guys. Our small contingent has been the guests of honor in several Indian holiday festivals at the work camp as well as enjoying marvelous working dinners hosted by our primary contractor who also happens to have a catering business! At times I am not sure what we're eating but I think it's just better to not ask! I can definitely tell you they make a mean lamb curry."



Tulsa District's James McCoy meets with a village governor at the Rajeebat Water Project which will provide drinking water for about 320 people.



"A Hooah Moment." Patrick 'Mac' McLaughlan from the Tulsa District took this photo of the Corps of Engineers flag waving proudly in the sunrise.

2008 Recreation Services to be Reduced

Flood and Ice Storm Cause Extensive Damage

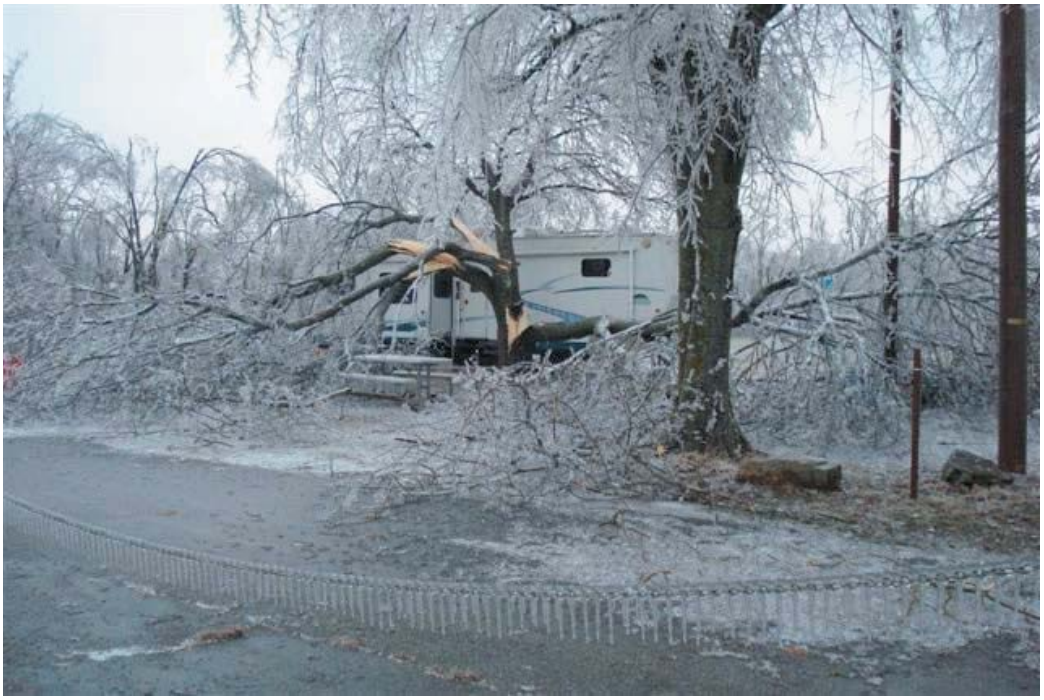
... from page 1

teers, we have been able to provide access back to the lakes. Volunteers have removed logs and other debris and have cleaned the areas. However, the major repairs that remain were unplanned and unbudgeted, and there is much more left to do.

The December ice storm did an additional $135,000 in damages to our public use areas. It has further complicated restoring access to the lakes in certain areas. Without funding to make the needed cumulative repairs, an estimated 2 million recreation visits to Tulsa District lakes will be foregone, resulting in a loss of over 900 recreation related jobs and over $30 million to the local economy.

The summer floods also adversely impacted the McClellan-Kerr Arkansas River Navigation System. Significant shoaling and constriction of various reaches of the authorized navigation channel occurred within the Oklahoma portion of the navigation system. While some emergency dredging was performed immediately after the flood waters receded to keep the system operating, the District is currently operating the system using deviations to the pool levels to maintain navigation. This is a temporary measure and reduces the amount of hydropower that can be generated along the river. Additional dredging is currently ongoing, but these additional costs result in a funding shortfall beginning in June 2008 to be able to continue normal operation of the navigation system. According to the navigation industry, each day the McClellan-Kerr navigation system is shut down results in a loss of income of $1.3 million.

We will continue working with our community partners to keep them informed and to get their input on possible solutions and prioritization of our efforts to minimize impacts. We will also continue to maximize the use of volunteers and available funds to make as many campsites available for use as possible, although amenities will be decreased. The safety of our visitors will be paramount in all of our decisions.



Ice damage at Hawthorn Bluff Recreation Area, Oologah Lake

December 2007 Ice Storm Impact

- Added to the damages created by the summer floods
- Damages added to District projects estimated at $135,000
- Majority of damage is tree debris
- Issues are primarily safety related:
- Cleanup safety
- Public use safety

Inundated restroom, Wilson Point Day Use Area, Hugo Lake

Tulsa District's Emergency Response

Pete Navesky
Emergency Operations Manager

"Emergency operations and our capability to react in an emergency is important for this nation. It ties very nicely with the Corps identified mission to support national economic development and security."

Calendar year 2007 saw Tulsa District establish a record five separate Emergency Operations Center activations. Working alongside the Federal Emergency Management Agency (FEMA) Regions VI and VII, we assisted citizens in Kansas, Oklahoma, and Texas. This assistance came from the Corps of Engineers Flood Control and Coastal Emergency (FC&CE) statutory authorities and from 22 different FEMA mission assignments issued to the District under the National Response Plan Emergency Support Function #3 (ESF-3) Public Works and Engineering assistance the Corps of Engineers provides to the country.

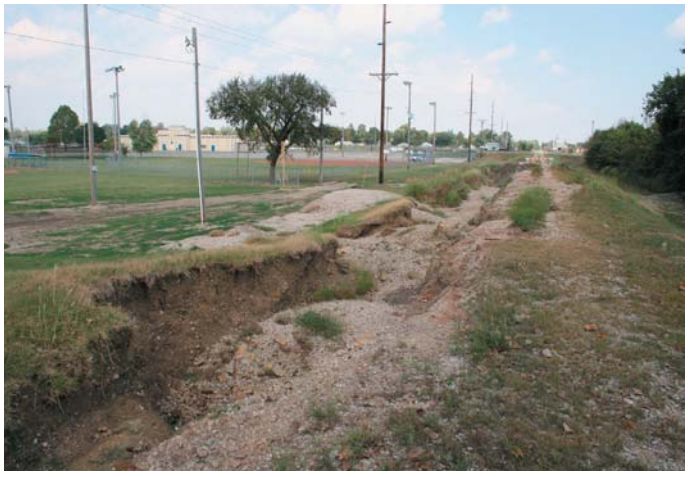
While it is claimed that lightening cannot strike twice in the same location, this adage apparently does not hold true for ice storms. The region ended 2007 the same way parts of the area began in January 2007, with another significant ice storm. Only this time the storm impacted the area to the north and west of the I-44 corridor which consists of the highest density of business and residences in the corridor from Oklahoma City, through Tulsa, into Miami, Oklahoma. Over 640,000 households lost power, typically for extended periods of time. Many lost power in excess of 7 days. This was almost 4 times the number of outages suffered by residents during the previous January ice storms.

An Emergency Power Mission was assigned to the Corps by FEMA Region VI late on a Sunday evening and by the middle of the week, a team of Tulsa District Emergency Power Planning and Response Team members, 249th Engineering Battalion "Prime Power" soldiers, and contract forces led by IAP Worldwide Services were underway installing what would ultimately number 43 generators at a variety of impacted critical public facilities across northeast and north central Oklahoma.

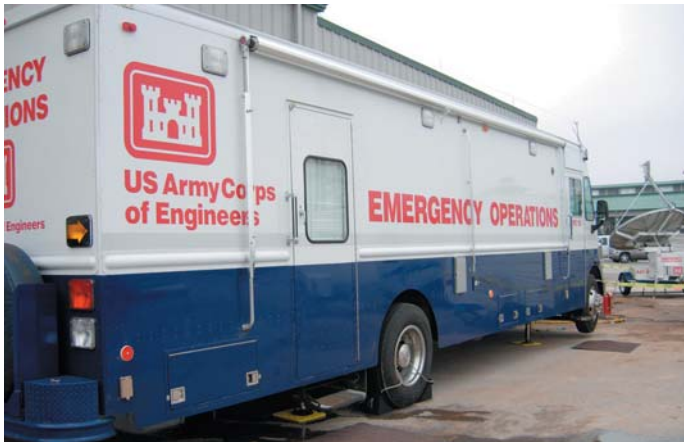
By the end of December, power had been restored and this mission was completed. We also provided technical assistance to cities and communities as they prepared to begin the massive debris removal and cleanup from the ice storm.

Earlier in the year, we were involved in support of the citizens of Kansas in the Greensburg area following the devastating tornado that impacted that community in May 2007. At the time of this publication, we continue to assist Kiowa County, the state of Kansas, and FEMA by executing the closure of the Construction and Debris (C&D) reduction site

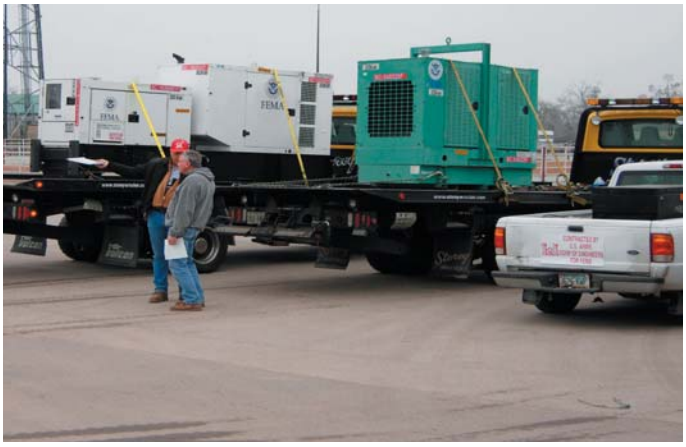
Above - A sample of the levee area damaged from the June/July flooding in Jenks, Oklahoma.



Right - Flooding damages to the levee in Iola, Kansas



Corps of Engineers Power Team Recovery Operations Center



Generators about to leave Tulsa, Oklahoma, to be installed

and landfill used for debris removal operations in the Greensburg area. This work is scheduled to be completed by the end of January 2008.

And lastly, under the Corps of Engineers FC&CE program, we are conducting a variety of repairs to levee systems that were damaged by the July 2007 floods in the communities of Coffeyville, Great Bend, Iola, Wichita, and Winfield, Kansas, and also in Jenks, Oklahoma. The repairs will all be completed in 2008.

Right - Concrete grinding operation at the Greensburg Construction and Debris site closure location

Dredging Team Wins "*Team Excellence Award*"

Awarded for "thinking outside the box," the dredging team of Tulsa and Little Rock Districts came up with unorthodox methods for removing shoaling at navigation mile 400 and 421 on the McClellan-Kerr Arkansas River Navigation System. The first idea was to attach a flume to the back of the M/V "Ozark" and push it with the Corps towboat "Mr. Pat". Doing this redirected the prop wash down which lifted the sediment and let the current carry it into deeper water. The team also used a barge-mounted trackhoe to pull the sediment to the side of the channel. Their operation successfully kept the channel open for navigation customers. Potential savings to navigation customers was in excess of $80,000 per day.

Tulsa District team members:

- Rodney Beard
- Pat McQueen
- Greg Barnes
- Kelly Youngblood
- Joe Johnson
- Colin Clark
- Troy James
- Dan Gibson
- Charlie Bennett
- Robert Booker
- Bob Perryman
- Kenneth Wright
- David Key
- Jimmy Vann
- Steven Fite
- Jerry Starling
- Todd Carr
- Larry Prestien
- Sarah Prestien

Little Rock District team members:

- Spencer Cox
- David Hill
- Matt Brock
- Chad Crain

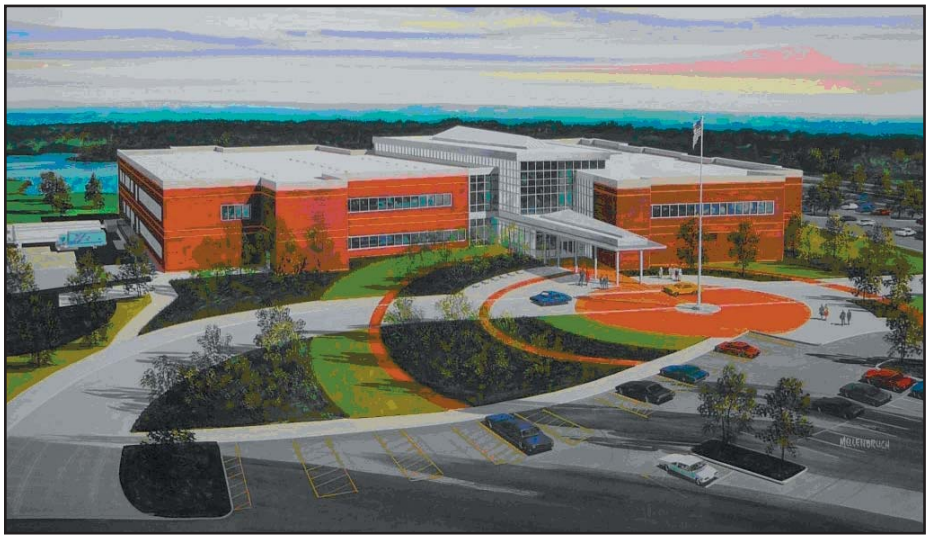
Tinker Air Force Base's Replacement Clinic wins Conceptual Design Award

A fiscal year 2009 project

Taylor J. Mann, PMP

On November 29, 2007, the Tulsa District along with the Sherlock Smith & Adams, Architects/Engineers (architect & engineer for the project), and Tinker Base Civil Engineering accepted the Air Force Materiel Command's (AFMC) Honor Award for the conceptual design of the FY09 Tinker Replacement Clinic at the 2007 AFMC Awards Luncheon in Dayton, Ohio. The Honor Award is the highest award given and represents first place in the design competition. The conceptual design will now be competed at the United States Air Force level, with awards to be announced in February 2008.

The project is a $63 million replacement of an existing out-of-date medical and dental clinic. The current clinic was constructed in 1957 as a hospital, but has since changed its mission to an outpatient clinic. The existing clinic also has numerous structural defects that can not be fully corrected. The solution is to design and construct a multi-story 173,419-square-foot medical and dental clinic. The new facility will provide for outpatient primary and selected specialty care clinics, ancillary departments, medical logistics, and administrative space. The project will also incorporate the medical requirements for the Air Force Reserves into the basic footprint of the facility.



Above - Architectural rendering of new clinic

Left - View of the interior lobby looking west

Below - Interior lobby looking east

Installation Engineers meet with Corps at BCE/DPW Workshop

Tulsa District hosted its annual Base Civil Engineer/Directorate for Public Works workshop December 4-5, 2007 at McAlester Army Ammunition Plant. Representatives from Altus Air Force Base, Fort Sill, McAlester Army Ammunition Plant and Tinker Air Force Base were in attendance as well as Senator Inhofe's Northeast Oklahoma Field representative.

This workshop served as an opportunity to bring the installation engineers together to determine the support needed of the Tulsa District in these increasingly challenging times as well as reviewing military customer care survey results.

Keynote speaker, Blu Hulsey from Senator Inhofe's office, provided updated information on Military Construction, Iraq Supplemental and Defense Appropriation Bills.

Southwestern Division Commander, Col.(P) Kendall Cox and Tulsa District Commander, Col. Anthony Funkhouser participated in the workshop, focusing on continuous improvement of Tulsa District services.

The workshop concluded with an overview of McAlester Army Ammunition Plant's mission and a tour of the Ammunition Production Line.

Blu Hulsey speaks with the participants at the BCE/DPW workshop.

Tulsa District's
Safety and Occupational Health Program

"Eagle Eye" Construction Safety Awards for Fiscal Year 2007

Construction Safety Award

W. G. Yates and Sons Construction Company is the winner of the Tulsa District "Eagle Eye" Construction Safety Award for fiscal year 2007. The firm won the award for its outstanding work on the "FY06 Student Pipeline Dormitory" at Sheppard Air Force Base, Texas. The project had numerous safety and health issues to manage and control, including excavation safety, high voltage electrical distribution safety, and difficult fall protection exposures. All of them were handled without a single lost-time accident.

Construction Office Award

Tulsa District's Resident Office at Sheppard Air Force Base is the winner of the "Eagle Eye" Construction Office of the Year award. Their active management of this contract set the tone for the safe manner in which work was conducted on the project.

Construction Representative Award

Aaron Goldner served as the Quality Assurance Representative on the contract and is the winner of the Tulsa District "Eagle Eye" Construction Representative of the Year.

(Back Row, Left to Right) **Ricky Rayford, Contract Electrical Engineer for the Corps; Lindal Roberts, Yates's Construction Safety Officer; Bob Vandegriff, District Safety Officer; Colonel Funkhouser**

(Front Row, Left to Right) **Gary Mezger, Sheppard Resident Engineer; Ben Tarver, Yates's Project Manager; Aaron Goldner, QA**

Arkansas City Aquatic Ecosystem Restoration

Section 206, Water Resources Development Act of 1996, as amended

Feasibility Study

The city of Arkansas City is located at the confluence of the Arkansas and Walnut Rivers in southeast Kansas, Cowley County, approximately 122 miles northwest of Tulsa, Oklahoma.

The proposed restoration site is located within the historic floodplain of the Walnut River. The recommended plan would improve various types of wildlife habitat over a total of 122 acres. Borrow pits would be modified to be productive fish habitat. Constructed wetlands would provide habitat to numerous types of wildlife as well as improve water quality. Species diversity and carrying capacity would be restored to bottomland hardwood stands and prairie grasslands in the project area.

Fiscal year 2008 efforts are focused on completion of feasibility study efforts that will detail the most cost-effective plan to restore this historic floodplain.

Arkansas River Corridor

Section 22, Water Resources Development Act of 1974, Public Law 93-251 (Planning Assistance to States Program)

Study

The Arkansas River is a valuable water resource that provides opportunities for redevelopment to promote economic development, ecosystem restoration, and other initiatives that would improve the quality of life for many citizens living in the Tulsa metropolitan area as well as visitors to the region.

At the end of 2006, we completed a comprehensive Master Plan which integrates economic development with ecosystem restoration. This plan identifies specific features and locations based on extensive public outreach efforts and technical analysis of the feasibility of the community's vision.

In 2007, we continued with Phase III of the Arkansas River Corridor Study which focused on engineering and environmental studies. Primary products from this phase include: an ecosystem restoration plan, geotechnical studies, recommendation for holistic approach to weir operation, design recommendations and baseline environmental data.

Two low-water dams have been identified as major components of the comprehensive ecosystem restoration plan. They are necessary as hydropower production at Keystone Dam has negatively impacted this riverine ecosystem. Tennessee Valley Authority was on the team to model impacts of various dam designs on the aquatic ecosystem and public safety. Tulsa County is the cost-share sponsor in Phase III.

The Water Resources Development Act of 2007 authorizes the expenditure of $50 million in Federal funds for implementation of features in the 2005 Arkansas River Corridor Master Plan. The local sponsors are working to make the congressional delegation aware of the need for $600,000 in 2009 for Tulsa District to complete the decision document and begin the National Environmental Policy Act process.

This project has generated great excitement within Tulsa County as well as the region. Other municipalities are closely watching the successes of our partnerships with both public and private stakeholders. Tulsa District is committed to providing support to the Tulsa community as they seek to integrate economic development with ecosystem restoration.

The Arkansas River Corridor Master Plan and documents are hosted on the Indian Nations Council of Government (INCOG) website.

Augusta Levee Local Flood Protection Project

Section 205 of the Flood Control Act of 1948, as amended (Continuing Authority - Flood Control)

Pre-Construction Engineering & Design

Augusta is about 19 miles east of Wichita, Kansas. The Whitewater River runs through Augusta to its confluence with the Walnut River.

The original levee was constructed in the 1920s and '30s through private and public sponsorship and was incorporated into the Federal Levee Inspection Program in the 1940s.

The November 1998 flood damages were caused primarily by the Whitewater River breaching of the city's levee system at several locations along the west side of Augusta. The recommended plan is to raise and extend the existing levee to provide a 500-year level of flood protection.

Fiscal year 2008 efforts are focused on completion of construction plans and specifications and execution of the Project Cooperation Agreement. We anticipate award of the construction effort in the summer of 2008.

Bartlesville Water Supply

Section 22, Water Resources Development Act of 1974

Study

On May 15, 2006, Mayor Julie Daniels and the Tulsa District signed the cost-share agreement for this study. The agreement was amended in January 2007 to allow the Oklahoma Water Resources Board to provide the cash portion of the non-Federal cost share.

It is a 50% federally-funded study that used the latest technology to project water supply needs for the next 50 years. The study team, including the city and

state, identified three water supply alternatives for further study. They were: the cost of storage and conveyance from Kaw Lake, the impacts for reallocating from the flood pool on Hulah and/or Copan Lakes, and non existent Sand Lake. Cost estimates were an integral part of this study.

This report was completed on time and delivered to local sponsors on December 31, 2007. Upon their review, further coordination with the study team will take place.

Another closely related project is the Hulah/Copan Reallocation Study. This study was signed by the Tulsa District Commander on April 26, 2007, and has been approved by Corps Headquarters. Water supply contracts totaling just over 12 million gallons per day were also approved but have not been executed by the city.

Big Lake Habitat Restoration, Oklahoma

Section 1135(b) of the Water Resources Development Act of 1986, as amended (Continuing Authority -- Habitat Restoration)

Feasibility Study

Big Lake is a locally-owned lake located along the Verdigris River in Rogers County, Oklahoma, about 10 miles northeast of Tulsa and approximately 15 miles downstream of Oologah Lake. Due to the McClellan-Kerr Arkansas River Navigation System channel and the impoundment of Oologah Lake, over 700 acres of forested wetlands are no longer subject to annual flooding.

The recommended plan would improve various types of wildlife habitat for 700 acres of bottomland hardwood forest, restore 100 acres of bottomland hardwood wetlands and an oxbow lake, and simulate natural flooding to the area.

In December 2006, environmental compliance efforts were completed for the study, and the final report was approved by Corps higher authority. This project is on hold until funding is made available to initiate construction efforts.

Blackwell Lake Clearing and Snagging

Section 208 of the 1954 Flood Control Act, as amended by the 1974 Water Resources Development Act

Project Design Analysis Underway

Blackwell Lake is located in Kay County, Oklahoma, near Braman, and is a primary recreational feature in that part of Oklahoma.

Due to the ice storm of 2001, a heavy load of logs and other debris have accumulated upstream of the Lake Blackwell Dam and spillway. The log jam is blocking access to the gate controls of the dam structure and has completely overwhelmed the normal maintenance capacity of the Lake Blackwell Trust Authority. The log jam has also significantly increased the flooding risks of the residential community immediately upstream (approximately 200 homes).

The recommended plan of improvement is to remove the log jam and properly dispose of the accumulated material.

Currently, this project is on hold due to lack of Federal funding. If funding were made available, fiscal year 2009 activities could focus on execution of the Project Cooperation Agreement and initiating construction efforts.

Candy Lake Land Sale

Water Resources Development Act of 1999

Land Sale

Candy Lake was deauthorized by publication in the Federal Register in December 1996. The Water Resources Development Act of 1999 authorized the Corps to sell Candy Lake project land at fair market value to the previous landowners or their descendants. The Corps contracted with General Services Administration to conduct a land appraisal and identify former landowners or their descendants and complete the Environmental Assessment.

Canton Lake, Oklahoma, Dam Safety Project

During the Environmental Assessment phase, evidence of cultural resource discoveries were identified. Further coordination with the State Historic Preservation Officer was required. Funding from the sale of the initial tracts of land were used to complete the investigation. Final cultural resource concurrence was granted by the State Cultural Resource Society in May 2007.

A total of 17 deeds have been executed by the Assistant Secretary of the Army for Civil Works and returned to the Tulsa District Real Estate Division for recordation in Osage County, Oklahoma. One remaining deed is currently being processed by the Corps and will be forwarded for execution by the Assistant Secretary of the Army for Civil Works by May 2008.

Parcels for which bids were not received from former owners or their descendants were transferred to the General Services Administration for further disposal through the Federal process. They are currently awaiting a formal decision

from the Bureau of Indian Affairs as to whether the Osage Nation is eligible to have the property held in trust on their behalf.

If the remaining tracts are not picked up by the Osage Nation or another Federal agency, they will be identified for disposal as surplus property.

Canton Lake, Oklahoma (Dam Safety)

Flood Control Act approved June 28, 1938 (Public Law 761); Flood Control Act approved July 24, 1946 (Public Law 526) (irrigation storage); Flood Control Act approved June 30, 1948 (Public Law 858); and the Water Resources Development Act of 1990 (Public Law 101-640) (water supply storage)

Under Construction

This is a $79 million multi-phase dam safety project with the first phase consisting of a Spillway Stabilization Construction Project in which 64 anchors were installed into the spillway to correct stability deficiencies. The first phase contract was performed by Nicholson Construction Company for $4.5 million and was completed in October 2006. In fiscal year 2007, a slurry trench contract was awarded in September to Geo Con for $1.4 million to construct a water barrier between the lake and the new location of the auxiliary spillway. Development of plans and specifications for the excavation contract also continued in 2007.

The next phase of the project, which will occur in fiscal year 2008, consists of relocating Highway 58A, relocating existing utilities and the award of the channel excavation contract.

Cowskin Creek, Local Flood Protection Project, Wichita, Kansas

Section 205 of the Flood Control Act of 1948, as amended (Continuing Authority - Flood Control)

Pre-Construction Engineering & Design

The Cowskin Creek Basin is located in the western part of Wichita, Kansas. This basin has sustained significant recurring flooding problems directly impacting residential areas. The November 1998 flood resulted in significant damage to about 200 homes and many businesses, some of which were damaged beyond 50% of their value.

The recommended plan of improvement would include channelization of a portion of Cowskin Creek with construction of an overbank area to convey the high flows during a flood event.

On September 14, 2007, the contract for construction of the Cowskin Creek Local Flood Protection Project was awarded to Pearson Excavating from Wichita, Kansas, for $2,489,828. Notice to Proceed was issued on October 3, 2007 and construction efforts should take approximately 18 months to complete.

East Tulsa County, Haikey Creek Watershed, Oklahoma

Section 205 of the Flood Control Act of 1948, as amended (Continuing Authority -- Flood Control)

Feasibility Study

The Haikey Creek watershed is approximately 9 miles long and a maximum of 8 miles wide, originating in Broken Arrow, Oklahoma, flowing generally southward within east Tulsa County through portions of the cities of Tulsa and Bixby. The drainage area contains approximately 37 square miles and is largely urbanized.

The city of Bixby requested assistance to reduce flooding and improve riparian habitat in the lower reach of Haikey Creek.

Potential improvements could consist of channelization of Haikey Creek and/or construction of a levee approximately 2-5 feet high.

Fiscal year 2008 efforts are focused on completion of feasibility study efforts which will recommend the most cost-effective plan of improvement.

Grand (Neosho) River Wetlands and Bottomland Hardwoods Ecosystem Restoration, Oklahoma

Section 206 of Water Resources Development Act of 1996, as amended (Continuing Authority -- Aquatic Ecosystem Restoration)

Planning

This ecosystem restoration project will focus on wetland bottomland hardwood habitat restoration along the Neosho River upstream of Miami, Oklahoma.

Project features could include outdoor classrooms and multipurpose maintenance trails that provide public access for nature-related recreation.

In December 2006, The Natural Resources Conservation Service at Stillwater completed a preliminary assessment report detailing possible improvements that could be accomplished.

This project is on hold due to a lack of Federal funds to complete the feasibility study effort.

Grand Lake Comprehensive Study

Section 449 of the Water Resources Development Act of 2000

Study

Grand Lake became operational in 1941 and its purposes include hydroelectric power (operated by the Grand River Dam Authority, an agency of the state of Oklahoma) and flood control (directed by the Corps). Grand Lake is located in the Grand (Neosho) River Basin (a sub-basin of the Arkansas River Basin) and is an integral component of a system flood control operation consisting of 11 principal reservoir projects in the Arkansas River Basin. The system operation of the 11 reservoirs also benefits the McClellan-Kerr Arkansas River Navigation System.

Grand Lake was designed and constructed by the Grand River Dam Authority and initially had a single purpose of hydropower production. In order to include Grand Lake as part of a

comprehensive multipurpose plan for the Arkansas River, the Flood Control Act of 1941 authorized the Corps to manage the flood control features. The flood control pool limits were established from elevation 745.0 to 755.0 (Pensacola datum). Flood flowage easements were acquired up to elevation 750.0 by the state of Oklahoma. Other Federal agencies acquired flood flowage easements from elevation 750.0 to 760.0. The flowage easements are now held by the Corps.

In response to public concerns, Congress established Section 560 of the Water Resources Development Act of 1996 which authorized the Corps to conduct a study that considered the combined operating purposes of flood control and hydropower. The September 1998 Grand Lake, Oklahoma, Real Estate Adequacy Study report documents that areas were found around the lake where, using current criteria and based on current lake operations, additional flowage easements would be recommended if Grand Lake was a "new" Corps project.

A letter report was prepared by the Tulsa District Corps to document an initial technical evaluation of historical and theoretical flood events. Based on review of the letter report, the Assistant Secretary of the Army for Civil Works concurred on September 14, 2007, that further detailed study is warranted. With that decision and in accordance with the provisions of Section 449 of the Water Resources Development Act of 2000, the feasibility study could be conducted at full Federal cost.

Existing funds will be used to complete a study/project management communications plan, hold a feasibility scoping meeting, and conduct data gathering with priority given to information that would help Ottawa County and the city of Miami, Oklahoma, in making short-term floodplain management decisions.

Potential future feasibility phase activities would be dependent on annual congressional funding. The purpose of the feasibility study would be to identify cost-effective solutions to the flooding problems consistent with current Federal policies. Categories of alternatives to consider include structural measures (such as levees), nonstructural measures (such as flood proofing and buyouts of flood prone structures), changes in the system operation, and combinations of measures.

A strategic activity, to address minor flood events, is the flood control pool releases consistent with the current system operating plan. While there is only limited and preliminary data at this time to confirm the effectiveness, it is likely that this approach reduces flooding related to the more frequent (minor/moderate) flood events. It is important to note, however, that large flood events, like those frequent in the late 1980s and 1990s, overwhelm available flood storages, significantly limit the ability to transfer flood waters to downstream lakes quickly, and cause significant flooding with or without operational modifications.

Grand/Neosho Ecosystem Restoration Study

Section 208, Flood Control Act of 1956

Study

The study area consists of the 12,500 square-mile Grand/Neosho River Basin in northeastern Oklahoma and southeastern Kansas. Flooding around Grand Lake, sedimentation problems in John Redmond Reservoir, and the 1,800 square miles of uncontrolled drainage areas have increased the need for a basin-wide study to address flooding and floodplain management problems and opportunities, and ecosystem improvements associated with aquatic habitats, wetlands, and watershed corridors.

A feasibility cost-share agreement was executed with the Kansas Water Office in September 2006 for the John Redmond Reservoir Study. This interim study focuses on the ecosystem degradation that has occurred in John Redmond Reservoir. This degradation is largely a result of sedimentation and nutrient loading. Other local issues such as the log jam and an assessment of dredging as an alternative are included in the multi-year study.

In 2007, we collected data for modeling, completed a sedimentation survey in the lake, and completed alternative formulation.

Ongoing actions for fiscal year 2008 include installing monitoring gauges, conducting watershed modeling, conducting sediment studies, and preliminary formulation of alternatives.

With additional funds in fiscal year 2009, we could complete the National Environmental Policy Act documents and prepare the draft feasibility report for the Division Commander's public notice.

Hulah/Copan Reallocation Study

Study

The Hulah/Copan Reallocation report was signed by the District Commander and sent to Corps Headquarters on April 26, 2006. Headquarters has approved the reallocation study as well as water storage contracts. This report, and its accompanying contracts, identified an additional 6 million gallons per day (mgd) for the city of Bartlesville, Oklahoma. The city has chosen not to execute the storage agreements until a follow-up study was complete. They now have the results of that study and are considering all options.

Severe drought conditions in 2001-2002 caused Hulah Lake to lose a considerable portion (over 80%) of its conservation pool. Bartlesville ceased using Hulah Lake for water supply on April 18, 2002 and, on an emergency, temporary basis, began withdrawing water from Caney River made available from Copan Lake water quality storage releases.

The reallocation study examined several alternatives to maintain consistent water supply for Bartlesville and surrounding communities through 2035. The report recommends reallocating water from water quality storage to water supply storage. Implementation of this action will cause no adverse impacts to biological or cultural resources. The hydrology analysis indicates that there would be no affect on downstream flooding. Because this is less than 15% of the total usable storage, the reallocation may be approved by the Chief of Engineers.

Joe Creek Ecosystem Restoration Project, Tulsa, Oklahoma

Section 1135, Water Resources Development Act of 1986 (Continuing Authority -- Habitat Restoration)

Feasibility Study

Joe Creek is a tributary to the Arkansas River at Tulsa, Oklahoma. The Joe Creek Local Protection Project was constructed under the authority of Section 205 of the 1948 Flood Control Act. A majority of the improved channel is concrete lined.

The proposed project will focus on improvements to the riparian stream corridor habitat that was impaired when the original flood control project was constructed.

Fiscal year 2008 activities are focused on completion of the detailed feasibility study efforts.

Lawton Wastewater Infrastructure

Section 219(f)(40), Water Resources Development Act of 1992 as amended

Pre-Construction Engineering & Design

The project consists of constructing wastewater infrastructure for the city of Lawton, Oklahoma. Lawton is located approximately 100 miles southwest of Oklahoma City in Comanche County, Oklahoma.

The city is conducting a 20-year, three-phase $63 million sewer rehabilitation program in response to a consent order from the Oklahoma Department of Environmental Quality. The program involves total replacement of sewer pipelines and upgrading of other components. The services provided by the city's infrastructure include off-base housing for the Army at Fort Sill. The Corps participation in the overall project will be approximately $2.5 million.

The city will provide the construction plans and specifications and the Corps will conduct all contracting and construction administration services as well as publication of the Environmental Assessment.

In fiscal year 2007, the Environmental Assessment was published and the Project Cooperation Agreement was drafted.

In fiscal year 2008, with the approval of the Project Cooperation Agreement, the sponsor can begin acquisition of real estate. If the agreement is approved in a timely manner and if there are no major real estate acquisition issues during fiscal year 2009, a construction contract could be underway in fiscal year 2010.

McClellan-Kerr Arkansas River Navigation System, Arkansas & Oklahoma, 12-Foot Navigation Channel

Section 136, Energy and Water Development Appropriations Act, fiscal year 2004 (Public Law 108-137)

Authorized (Not Started)

The McClellan-Kerr Arkansas River Navigation System is approximately 445 miles long, consists of 18 locks and dams, and provides 9-foot deep inland navigation from the Mississippi River to Catoosa, Oklahoma. In 2005, the system carried 12.9 million tons of various materials to include petroleum products, wheat, chemicals, and steel.

This project would deepen the navigation channel to a minimum depth of 12 feet thereby increasing the efficiency of the system. Deepening of the channel will be performed by a combination of techniques including altering the flow management, constructing dikes and jetties and dredging the channel. This project also includes a significant environmental component to include creation of bottomland hardwood forests and high quality wetlands as well as other environmental enhancements.

This project has a projected cost estimate of $165.5 million and is jointly managed by both Little Rock and Tulsa Districts. To date, $7.0 million was provided through a fiscal year 2005 congressional add to complete the feasibility study and the Environmental Impact Statement as well as to start dredging activities and construction of dikes and jetties.

During fiscal year 2006, dredging commenced and was completed at mile 348 in Pool 15 in Oklahoma as well as commencing construction of training structures in Pools 2 and 7 in Arkansas. Construction of a Least Tern Island with rock protection was also accomplished in conjunction with the dredging activities in Pool 15. Design of river structures was accomplished for Pools 2, 7 and 5. Mitigation activities including aquatic and terrestrial surveys were performed in both Oklahoma and Arkansas. A five-year project plan was also developed for the project that includes an integrated project breakdown of activities and associated costs that has been vetted through the navigation stakeholders.

This project was not included in the fiscal year 2007 budget. However, fiscal year 2006 carryover funds where used to place stone structures to improve self scour in Arkansas, continue the design of upland dredge disposal sites, and continue real estate efforts in Oklahoma.

This project is not included in the fiscal year 2008 budget. The only activity scheduled for fiscal year 2008 is the completion of the design for the upland dredge disposal sites. After this design is completed, funds will be exhausted resulting in no further work ongoing on the project.

North Canadian River Aquatic Ecosystem Restoration Project, Oklahoma

Under Construction

The project is essentially complete and consists of the reestablishment of an aquatic wetland ecosystem corridor along the North Canadian (Oklahoma) River between Western Avenue and May Avenue in Oklahoma City. The restoration was accomplished by constructing about 26.5 acres of wetlands and related water control structures to manage the wetlands. The low-water dam near Western Avenue was constructed by Oklahoma City and creates a backwater pool with about 145 acres of open water aquatic habitat and provides a reliable source of water for the adjacent wetlands. Approximately 54 acres of bottomland hardwood and riparian trees along with native grasses were planted along both sides of the river to reestablish a contiguous riparian corridor. An irrigation system was installed to water the plantings.

Included in the project are two multipurpose maintenance trails consisting of a 12-foot-wide asphalt trail and a 6-foot-wide concrete trail.

Adaptive management measures, consistent with Federal criteria, were completed at the Pennsylvania Avenue wetland in November 2007 to assure project compatibility with Oklahoma City's comprehensive plan for the Oklahoma River corridor.

Oklahoma Comprehensive Water Plan

Study

We are providing technical planning assistance to help the Oklahoma Water Resources Board update the Oklahoma Comprehensive Water Plan (OCWP). Initial assistance is being provided through the Planning Assistance to States (PAS) program. The PAS study includes the following fiscal year 2008 activities: 1) the development and initial implementation of a programmatic work plan for the technical studies component of the OCWP and 2) the policy component activities associated with the OCWP. Coinciding with these integrated efforts is an extensive public participation program to create a transparent and open planning process. Contingent on approvals and future funding it is anticipated that information from Watershed Management Plans, developed during the on-going Southeast Oklahoma and proposed Washita River General Investigations studies, will also contribute pertinent existing, forecasted, and strategic information for the OCWP.

The first phase of the OCWP update will focus on development of water demand projections by county and region throughout forecast year 2060 as well as a comprehensive inventory and analysis of the state's water supplies.

Phase two of the updated water plan will identify local and regional problems and opportunities related to the use of water for public supply, agricultural, industrial, recreational, and environmental uses. This particular segment of the planning process, involving close partnerships with both municipal and rural water system representatives, will identify infrastructure needs, management options, and other measures to maximize the efficiency of Oklahoma's public water suppliers.

The third phase of the state water planning process involves the implementation of planning initiatives and tools derived from the issues, problems and needs identified during phase two. The Oklahoma Water Resources Board is drawing upon the expertise of Oklahoma's foremost water experts from various water use sectors, local, state and Federal governments, and universities to develop policy recommendations for consideration by the state legislature.

The Water Resources Development Act of 2007 authorizes the expenditure of $6.5 million in Federal funds for completion of the Oklahoma Comprehensive Water Plan. It further specifies that this effort will be completed with a 75% Federal and 25% non-Federal cost share.

Oologah Lake Watershed Feasibility Study, Oklahoma and Kansas

Section 206, Flood Control Act 1958; Resolution adopted on May 25, 1960 by the House Committee on Public Works

Study

The Verdigris River Basin drainage area is approximately 4,300 square miles and is located in southeastern Kansas and northeastern Oklahoma. This basin is impounded to form Oologah Lake.

The study will address impacts of upstream development on aquatic and terrestrial habitat within the basin. Upstream development has adversely affected the water quality at Oologah Lake which is a water supply source for the city of Tulsa.

In July 2007, continued to model alternatives, and calibrating the lake model and gathering data. We began a detailed institutional analysis which is an tremendous collaborative effort with other Federal, state and local agencies.

In 2008, funds are being used to complete the institutional analysis, appendixes to watershed management plan and the first draft of the plan.

Dependant on Federal funding, the study should be complete in 2010.

Sand Creek Ecosystem Restoration Project, Newton, Kansas

Section 1135 of Water Resources Development Act of 1986, as amended (Continuing Authority - Habitat Restoration)

Pre-Construction Engineering & Design

The Sand Creek Ecosystem Restoration Project focuses on improvements along Sand Creek within the city limits of Newton, Kansas. The Sand Creek Local Flood Protection Project was completed by the Corps of Engineers in April 1967.

The proposed project will focus on improvements to the riparian stream corridor habitat that was impaired when the original flood control project was constructed.

Webbers Falls Inclined Axis Turbine Shaft

On January 30, 2008, the Sand Creek construction contract was awarded to Utility Contractors, Wichita, Kansas, for $10,371,766 and the remaining fiscal year 2008 efforts will be focused on project construction.

Spavinaw Lake Watershed Feasibility Study

Section 208, Flood Control Act of 1965 (Public Law 89-298)

Study

Spavinaw Creek, and its downstream impoundments - Eucha and Spavinaw Lakes, is severely impacted by nutrient loading and excessive algae growth as a result of agricultural practices in Arkansas and Oklahoma. Degradation of water quality has led to taste and odor problems, increased treatment costs, and the lakes' decreased recreational and aesthetic value. Together, Spavinaw and Eucha Lakes provide 47% of the water supply for the Tulsa metropolitan area. The Tulsa Metropolitan Utility Authority entered into the feasibility cost-share agreement in June 2004.

Because of extensive ecosystem restoration work being done by the poultry industry in the watershed, this study is focused on in-lake solutions.

In fiscal year 2007, we continued with alternative analysis. This included identifying and contracting with engineering experts to help with the analysis. With alternatives clearly identified, environmental analysis also began.

In 2008, the team will complete all studies and the report will be completed first quarter of fiscal year 2009.

Tar Creek and Spring Creek Watershed Management Plan Development

Complete

The Tar Creek Grant for $3.5 million was awarded by the Corps of Engineers to the Oklahoma Department of Environmental Quality on June 12, 2007. The grant was restricted to demolition of homes purchased by the state of Oklahoma in the communities of Picher, Cardin, and Hockerville in the Tar Creek area, in accordance with Section 111 of Public Law 108-137 authorized purposes.

The state of Oklahoma has begun relocating citizens because of subsidence potential identified in a January 2006 Subsidence Report prepared by the Corps of Engineers. The grant allows use of the funds over the next two years with two one-year extensions possible. The relocation is anticipated to cost $40 million in Federal funds for a voluntary buyout of approximately 700 qualifying residents, businesses and public-use facilities.

Section 3135 of Water Resources Development Act of 2007 revised the purposes of the $3.5 million grant such that the funds can be used for relocations. An environmental assessment for the revised use of the funds and the revised grant was completed on January 25, 2008. A revised grant to the state of Oklahoma was completed on January 30, 2008 which amended the use of the previously granted $3.5 million and added the $3.444 million which was appropriated to the Corps of Engineers in the 2008 Omnibus Bill.

Walnut River Basin Feasibility Study

Flood Control Act of 1965, approved October 27, 1965; Public Law 89-295, HD 232, 89th Congress, 1st Session

Study

The first phase, a reconnaissance study, was conducted by the Corps to examine water resources problems and identify measures to resolve identified problems. The reconnaissance efforts were at full Federal expense. Successful completion was realized with the identification of several potential solutions to water resources problems in the Walnut River Basin. The study was conducted in cooperation and with the assistance of the Kansas Water Office, the U.S. Fish and Wildlife Service, and other state resource agencies whose contributions are gratefully acknowledged.

The second phase, an interim feasibility study, was conducted as a cost-shared effort between the Corps of Engineers and the local sponsors the state of Kansas (represented by the Kansas Water Authority and the Kansas Water Office) and the city of El Dorado, Kansas. The scope of the feasibility study began as an examination of the Walnut River Basin and potential ecosystem restoration opportunities that would use the state's established best management practices. The nature and scope of the study changed as the feasibility study progressed. After a year of study formulation and coordination with a local interest steering committee, the study was shifted at the state's request to an evaluation of the upper Walnut River

Basin consisting of the El Dorado Lake and watershed. The city of El Dorado became a local co-sponsor. The nature of the feasibility study also changed to a watershed management plan. The purpose of the management plan was to identify and evaluate solutions to within-reservoir and watershed problems identified by the Kansas Water Office and the city of El Dorado that could be implemented in small steps leading toward long-term watershed objectives.

Development of the watershed management plan was guided by two long-term restoration and protection goals and twelve specific objectives formulated by the sponsors. The goals were: 1) Identify effective reservoir restoration and protection measures to ensure long-range availability of storage space for public water supplies in Federal reservoirs, using El Dorado Lake as a pilot (with eight objectives); and 2) Identify watershed restoration and protection needs and determine opportunities to implement effective management practices (with four objectives). The goals were generally met, but some objectives were either not fully met or were not achievable within the time and budget resources of the study.

Recommendation Summary. The following recommendations are predicated on the findings of the study team through site investigations, interagency and public coordination, and forecasts from the Soil and Water Assessment Tool (SWAT) model. Of these findings, the greatest potential for changes is associated with the model forecasts. In particular, the model was calibrated for sedimentation transport, in part, using the original sediment design rates for El Dorado Lake.

The design sediment rates were estimated during the preconstruction engineering of El Dorado Lake in the 1960s. Since construction, the Corps has attempted to update the sedimentation rates for the flood control pool, the conservation pool, and the inactive pool by conducting sediment surveys in 1989, 2001, and during this study in 2004. Also during this study, an attempt was made to compare preconstruction topography to the 2004 sediment survey. Unfortunately, the different methods among map production and sediment surveys did not result in useable area-capacity comparisons or an update of the sedimentation rate. The methodology used for the 2004 bathymetric survey will, however, provide a high quality baseline for comparison to future sediment surveys.

Additional data could be collected in the near term to update the sedimentation volume in El Dorado Lake. The additional data would also notably improve the soundness of forecasts using the model.

The model forecasts can identify locations in the watershed where the application of management measures (and funding) will most effectively return positive watershed benefits. Of the data collection approaches discussed in this management plan, the more economical approach to obtaining additional sedimentation data would be a sediment source evaluation. A sediment source evaluation should include sufficient measurements of lake sediment depths to allow an estimation of total sedimentation volume and a projection of source contributions from uplands or channel erosion. (Note: The state has recently participated in this type of study with the U.S. Geological Survey for Perry Lake and the Wabaunsee Basins.) Obtaining additional sedimentation data for use in supplementing the SWAT model should be one of the highest priority efforts for El Dorado Lake watershed management.

The prioritization of watershed management measures, as forecast through use of the SWAT model, may change from those presented in this management plan once the sedimentation rate can be updated. However, the priorities currently indicated can be used to guide the application of Federal and state resources in the watershed. Historically, however, there has been little need for prioritization of watershed restoration and protection measures sponsored by Natural Resources Conservation Service (NRCS) and Kansas State Conservation Commission (KSCC) in the El Dorado Lake watershed. The number of applicants and total cost of applied measures has traditionally been less than the funding available to those programs. A number of program issues and concerns were expressed by the public during the study. Those issues and concerns were most frequently related to misinformation and financial incentives that were less than those perceived from agriculture profits. Additional communication and economic incentives appear to be the most viable approach to increase the number of applicants and the scope of participation in existing Federal and state conservation and restoration programs.

From the Ecology Society of America, ***Issues in Ecology*** (Number 2, Spring 1997), "Ecosystem services are generally greatly undervalued, for a number of reasons: many are not traded or valued in the marketplace; many serve the public good rather than provide direct benefits to individual landowners; private property owners often have no way to benefit financially from the ecosystem services supplied to society by their land; and, in fact, economic subsidies often encourage the conversion of such lands to other, market-valued activities. Thus, people whose activities disrupt ecosystem services often do not pay directly for the cost of those lost services. Moreover, society often does not compensate landowners and others who do safeguard ecosystem services for the economic benefits they lose by foregoing more lucrative but destructive land uses. There is a critical need for policy measures that address these driving forces and embed the value of ecosystem services into decision making frameworks."

The economic cost required to protect existing watershed resources (those with a naturally functioning environment) is very low when compared to the costs required to restore a similar set of degraded environmental functions. The cost gap is largely caused by the low success rate of restoration efforts. The low success rate is due to the complex interdependencies of ecosystem drivers and our imperfect understanding of the system. The state of the science has improved, but even current restoration efforts rarely produce desired levels of ecosystem function. Protection of steam, riparian corridor, and watershed ecosystem services (functions) is a high priority -- certainly more economical and argu-

ably a higher priority than restoration of similar services.

The implementation of grass filter strips on El Dorado Lake project lands provides an opportunity to reduce sedimentation from predominantly upland erosion. Erosion from the lake area (SWAT model area #48) is modeled to contribute nearly 20% (19.5%) of the total sediment load entering the reservoir. The issues that limit implementation opportunities are less restrictive for this area because the filter strips would be developed on Federal project lands managed for wildlife and park resources by the Kansas Department of Wildlife and Parks (KDWP) as opposed to implementation on private lands elsewhere in the watershed. The potential for sediment reduction would be greater if grass filter strips and other conservation measures were also implemented upslope of project lands in model area 48. Regulatory requirements prior to implementation would be directed by Corps staff located at the project office. The primary limiting factor for developing grass buffers would be funding: Federal funding through Operations and Maintenance appropriations for environmental stewardship, state funding through the KDWP, and city or county funding. Implementation of grass filter strips by the Corps and KDWP on El Dorado Lake project lands is a high priority for the reduction of sedimentation and the preservation of water supply storage and the aquatic environment. Implementation of grass filter strips and other conservation measures by the NRCS, KSCC, Butler County, and the city of El Dorado upslope of El Dorado Lake project lands is a high priority for the reduction of sedimentation and the preservation of water supply storage and the aquatic environment.

Implementation of best management practices, such as grass filter strips to intercept runoff from row crops and lands used for grazing, would reduce the amounts of sediments, nutrients, herbicides and pesticides carried by streams in the watershed. Environmental improvements would begin immediately downstream of points in the watershed where the runoff of agrichemicals were reduced. The improvements would extend downstream through the watershed (and further downstream) as other streams merged with the El Dorado Lake releases. The nutrients such as phosphorus and nitrogen originating from applied chemicals and from animal wastes are transported by runoff and stream flow. A portion of these and other nutrients are trapped with sediments deposited in El Dorado Lake. The state Total Maximum Dailly Load (TMDL) for eutrophication includes some of the desired implementation activities. Implementation of best management practices listed in the eutrophication TMDL, including but not limited to the following, is a high priority for improving El Dorado Lake conditions:

- Implement soil sampling to recommend appropriate fertilizer applications on cropland.
- Maintain conservation tillage and contour farming to minimize cropland erosion.
- Install grass buffer strips along streams.
- Reduce activities within riparian areas.
- Implement nutrient management plans to manage manure application to land.

Webbers Falls Powerhouse Major Rehabilitation, Oklahoma

River & Harbor Act, approved July 24, 1946; Project Document HD 758, 79th Congress, 2d Session

Under Construction

The run-of-river power plant contains three 23,000 kilowatt (kW) inclined-axis Kaplan-type generating units with a total rated generating capacity of 60,000 kW. These turbines were the first tube turbines of this magnitude ever built and placed in operation. As a result, the design did not consider all of the factors that would be specific to the operation of slant-axis turbines and consequently, the project has been plagued with mechanical reliability problems during its operation. Currently, one turbine is non-operational; the two remaining units will continue to fail regularly until they can no longer generate power. The major rehab project will replace all three turbines resulting in $1.32 million of net benefits per month to the nation. In addition to rehabbing the turbines, the cranes will be rehabbed, the generators will be rewound and turbine governors will be upgraded which will increase the capacity of the plant by 8.5%.

The Webbers Falls Powerhouse Rehabilitation project current cost is $65.2 million. In February 2001, the Corps of Engineers Hydroelectric Design Center (HDC) recommended that the Ozark and Webbers Falls turbine replacements be combined into one contract for a savings to the government and power customers of over $5 million. The Webbers Falls Turbine Replacement contract was subsequently included in the Ozark contract as an option and awarded May 3, 2005. This option expires May 3, 2008.

Fiscal year 2008 activities include the award of the turbine and generator bay bridge crane rehabilitation contracts as well as awarding all three turbine runner contract options using customer funds. On December 19, 2007, the first option was awarded with the remaining two options scheduled for award prior to May 2008.

Specific fiscal year 2008 activities include rehabbing the existing turbine and generator bay bridge cranes, fabricating the first new turbine runner and disassembly of the existing non-operational Webbers Falls turbine runner.

Red River Basin

Bowie County Levee

Energy and Water Development Appropriation Act of 2001 and 2002

Pre-Construction Engineering & Design

The Bowie County Levee is located near Texarkana, Texas, in Bowie County, Texas. The existing levee is 8.8 miles long and was built in 1913. The locally preferred plan, known as Alternative B, is the plan which will be constructed. This plan consists of restoring 6.0 miles of existing levee, constructing 4.0 miles of new levee, and constructing 1.4 miles of channel to divert Barkman Creek flows to the Red River.

In fiscal year 2007, the extensive archaeological survey and report were completed, the Project Documentation Report (PDM) was updated, plans and specifications were approved, a wildlife habitat mitigation plan was coordinated, an Environmental Assessment (EA) was published, and a Post Authorization Change Report (PAC) was drafted.

In fiscal year 2008, the PAC should be approved. This report will serve as the project Decision Document and, therefore, the basis for drafting the Project Cooperation Agreement (PCA). The PCA will be submitted late in fiscal year 2008. Approval of the PCA should come late in fiscal year 2009. This will clear the way for the sponsor to begin real estate acquisition during fiscal year 2010 and complete in fiscal year 2011. Upon completion of the real estate acquisition, a construction contract can be awarded and construction can begin.

Kemp Lake Reallocation Study

Water Resources Development Act of 1986

Study

Lake Kemp is located on the Wichita River at river mile 126.7 in Baylor County, Texas. Lake Kemp was originally constructed in 1924 by the Wichita County Water Improvement District #1. The lake was constructed for the primary purposes of irrigation, water supply, and related uses.

The reallocation study is being conducted with the Texas Water Development Board in conjunction with the Wichita County Water Improvement District #2 and the city of Wichita Falls.

In 2007 the District awarded a contract to conduct a cultural resource study and a sedimentation study.

In 2008, we plan to complete engineering studies, economic studies, and analyze alternatives.

The project is operated and maintained by the Wichita County Water Improvement District #2 and the city of Wichita Falls, Texas.

During the design and reconstruction of Lake Kemp, sedimentation was a key consideration. Design Memorandum No. 1 recommended raising the conservation pool after 40 years of operation to recover conservation storage lost to sedimentation. The latest sedimentation survey performed at Lake Kemp was in 1973, and it indicated an expected high level of sedimentation. In recent years, during drought conditions, the upper portions of Lake Kemp appear severely impacted by sedimentation.

Mangum Geotechnical Study

Section 22 of the 1974 Water Resources Development Act

Study

Phase VI of the Mangum Lake Geotechnical Study will focus primarily on cost estimates for the preferred dam alignment. We will also drill one bore hole and develop a piezometer at the site. Funding caused a delay of this phase but the project will be complete in fiscal year 2008.

The recently completed Phase V study was comprised of a geotechnical investigation and stream loss study of the proposed dam site near Mangum, Oklahoma. The Oklahoma Water Resources Board was the cost-share partner.

Foundation conditions at the proposed Mangum Dam site, 2 miles southwest of Mangum on the Salt Fork of the Red River, appear to be favorable. Complex geology and karstic conditions impose limits on elevation, size and capacity of Mangum Reservoir. While the proposed dam site was proven feasible, the elevation needs to be 1550 feet (mean sea level) for structural stability rather than the locally preferred 1560 feet. The difference in elevation reduces the acre feet of storage by half.

Further study could be focused on additional characterization of foundation conditions, hydrogeology and water loss.

Red River Basin Chloride Control Project

This project was authorized for construction by the Flood Control Act of 1966, approved November 7, 1966,

Under Construction

The Red River Chloride Control Project is authorized to identify and implement measures to reduce naturally occurring brine emissions into several subbasins within the Red River Basin in northern Texas and southern Oklahoma. The project's primary purpose is to improve water quality for municipal, industrial, and agricultural uses along the Red River within Oklahoma, Texas, Arkansas and Louisiana.

Improvements include construction of a low-flow dams, pump stations, and diversion pipelines to impoundment facilities.

This project is a select major water strategy of the 2007 Texas Water Plan for the region and the state of Oklahoma has expressed a renewed interest in the

Area VI element of the Red River project and reevaluation efforts are underway. Area VI is located on the Elm Fork of the North Fork of the Red River in Harmon County, Oklahoma.

Portions of the Wichita River Basin Chloride Control element, located in northwest Texas, have been constructed and have been in operation since 1987. Features completed and in operation include two low-flow collection dams, a pump station and diversion pipeline to the Truscott Brine Disposal Reservoir.

Recently, construction efforts had been placed on hold until a cost-sharing partner was identified to assume the operation and maintenance responsibilities. However, passage of Section 3136 of the Water Resources Development Act of 2007 reaffirmed that operation and maintenance responsibilities would be at full Federal expense. Pending sufficient Federal funding, construction efforts will resume.

Fiscal year 2008 efforts are focused on completion of contract plans and specifications at Area VII in Texas and continued reevaluation efforts for Area VI within the Elm Fork Basin in Oklahoma. In addition, detailed baseline environmental monitoring activities are continuing.

Southeast Oklahoma Water Resource Study

1983 Supplemental Appropriation Act (PL 98-63)

Study

The Oklahoma Water Resources Board is the sponsor and they have requested that the study scope be updated to be consistent with the development of the Oklahoma Comprehensive Water Plan (OCWP). A draft of the programmatic work plan for the OCWP is currently under review.

The cumulative effects of land use changes in the Kiamichi River Basin and other tributaries of the Red River have resulted in a loss of habitat for a number of aquatic species that are critical to the functioning of the riverine ecosystem. The Corps of Engineers was authorized to investigate water resource related problems in the study area which encompasses 29 counties in southeast Oklahoma including the Kiamichi River Basin and other tributaries of the Red River.

The reconnaissance study found a Federal interest in ecosystem restoration in the Kiamichi River Basin. That study recommended proceeding to a cost-shared feasibility study with the Oklahoma Water Resources Board as the local sponsor.

The reconnaissance report was certified in January 2001. The feasibility cost-sharing agreement was signed with the local sponsor, the Oklahoma Water Resources Board, on July 10, 2001.

This is a complex, 11-year feasibility study that will be conducted in 5 phases. Phase 1 involves rough estimates of the water available in the Kiamichi River and Little River Basins for environmental restoration after other water needs have been met.

The next phase of this study will consist of an infrastructure assessment and water use impacts on this important natural resource.

Texoma Reallocation Study

Water Resources Development Act of 1986

Study

The Water Resources Development Act of 1986 authorized the Assistant Secretary of the Army for Civil Works to reallocate 300,000 acre-feet of storage from hydropower to water supply storage at Lake Texoma. The law specified that 150,000 acre-feet of storage would go to Texas and Oklahoma with 50,000 acre-feet of the Texas total going to the Greater Texoma Utility Authority. The North Texas Municipal Water District (NTMWD) has expressed an interest in the remaining Texas storage.

The final public review of the Environmental Assessment on the reallocation report ended in January 2006. Responses to comments were completed in early May and the final Environmental Assessment, reallocation report, and water supply agreements were sent to Corps Headquarters in June 2006. Tulsa District received Headquarters' comments in November 2007. Comments will require extensive collaboration with Southwestern Power Administration, the vertical team and the Corps Hydrologic Engineering Center.

The final report recommends the reallocation of 300,000 acre-feet from hydropower to water supply. Water supply agreements for 105,000 acre-feet were sent with the report for review and approval.

Washita Feasibility Study

Red River and Tributaries above Denison Dam, Texas, Oklahoma, and New Mexico, House Resolution dated February 25, 1938; Senate Resolutions dated February 18, 1954 and June 19, 1962

Study

The Washita River is a tributary to the Red River in Oklahoma and flows into Lake Texoma.

The Oklahoma Water Resources Board submitted a letter of intent to cost share the feasibility phase of the study. They are interested in a study that will produce information to be integrated into the Oklahoma Comprehensive Water Plan.

The reconnaissance report was revised to reflect that intent and submitted to Corps Headquarters for approval in December 2007.

In 2008, a feasibility cost-share agreement will be executed and feasibility studies initiated.

For updated project information, access our web site at:
http:\\www.swt.usace.army.mil
or call 1-918-669-7366